

ALTERNATIVE METHODS
FOR
STOCKING MOUNTAIN LAKES

McCALL FISH HATCHERY

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INTRODUCTION

The McCall Hatchery is responsible for planting over 600 mountain lakes in Regions 1, 2, and 3. Most of these lakes are planted by the use of fixed-wing aircraft (Cessna 185). With the ever-increasing cost of flight time, alternative methods were explored for planting mountain lakes. A summary of methods used for planting mountain lakes will be presented in this report, including a cost breakdown.

FIXED-WING

Seventy-two mountain lakes were planted by fixed-wing aircraft (Cessna 185). As in the past, McCall Air Taxi did the flying in 1986. Flight time was purchased at \$150 per hour. There were 13 hours and 9 minutes of flight time used, costing \$1,972. Cost per lake stocked was \$27.40 for flight time (Table 1). Once personnel costs were added in, the cost per lake stocked by fixed-wing aircraft was \$28.96.

Although stocking by fixed-wing aircraft is the quickest way to stock several lakes, it does have some drawbacks. First, flights can only be made when the weather is conducive for flying. Rain, winds, and smoke can postpone flights. Second, with a target size of 1,000 fish per pound for stocking from fixed-wing aircraft, time for stocking is limited. The reason for trying to stock at 1,000 fish per pound is that the fish will fall with the water. Considerably smaller fish may not fall with the water, causing undue shock. Considerably larger fish should not be stocked due to limited aircraft space. During 1986, two flights were canceled at the last minutes due to weather conditions.

While in the air, there is a chance to get an overview of the lake, but not necessarily a good survey of the lake itself. Other planting methods provide the opportunity to survey the lake in more depth.

Finally, there is always the chance that the fish drop could miss the lake. Most air drops are centered in the middle of the lake for safety reasons, not necessarily the best area for the fish. Also, there is no chance for tempering the fish. Since the fish are loaded in bags of cold water for traveling, the effect of temperature shock on the fish planted in mountain lakes is questionable.

ALTERNATIVE METHODS

Backpacking, horse packing, motorcycles, and helicopters were used for stocking mountain lakes by the McCall Hatchery in 1986. The overall average cost of using alternative methods was \$13.50, compared to a cost per lake planted by fixed wing aircraft of \$28.96.

BACKPACKING

Thirteen lakes were backpack-planted during 1986. The cost per lake planted by backpacking was \$31.03. All backpack plants were accomplished by using at least two hikers for safety reasons.

Backpack plants can be done on a reasonable time schedule with only the harshest weather causing postponements. Fish may be stocked at a smaller size than with fixed-wing aircraft because of the assurance that they will get into the water. There is also an opportunity to temper the fish, so temperature shock is not a factor in survival. Fish can be planted in the littoral area of the lake, giving them more cover to decrease chances of predation.

By backpacking into a lake, there is opportunity for a more complete lake survey. The amount of littoral zone, the number of inlets and outlets, and the size can be better judged. There is also a chance to check the fish population in the lake by noting the frequency of fish rises. In some cases, sampling the fishing quality can be accomplished during a lunch hour. An idea of the amount of use the area gets can also be gained when backpacking by noticing other hikers, campers, fire rings, and, unfortunately, litter. All of this information can be very valuable to the Regional Fishery Managers when developing a stocking schedule for a particular lake.

Lakes more suited for backpack stocking are relatively close to the hatchery and within three to six miles from the trailhead. Much also depends on the physical condition of the hiker and the severity of the trail.

Bags should be loaded with less than one pound of fish for best results. Rainbow trout seem to do better on longer hikes. After seven hours in a bag, rainbow trout were planted in good condition, suffering very minimal mortalities (Table 2). Westslope cutthroat trout loaded at similar rates did not fair as well for long periods of time. It appears that five hours is about the maximum time that Westslope cutthroat trout can handle being in bags. As with fixed-wing flights, the water is chilled before the fish are loaded into bags. The bags should be kept on ice in coolers while transporting the fish to the trailhead.

Although most of the backpack fish plants were accomplished by staff members at McCall, there are alternatives. One that was quite successful involved a group of Boy Scouts from the local scout camp. The scouts, along with a bio-aide from the hatchery, planted three mountain lakes in one day. They were very excited about the opportunity to get involved with the Idaho Department of Fish and Game. This appears to be a good source of volunteer help. Other groups may also be interested in backpacking fish plants. Involvement of groups, such as the Boy Scouts, serves to increase the public's awareness of the mountain lake stocking program, along with promoting good public relations.

HORSE PACKING

Two lakes were stocked by taking horses into the lakes: 1) one lake by a local conservation officer patrolling a particular area, and 2) the other lake by a local outfitter while checking out lakes for guide services. With prior planning, several lakes in an area can be planted when conservation officers are on patrol. Also, outfitters may be an untapped source of volunteer help when planting mountain lakes.

Although this may be the exception rather than the rule, there was a problem on one of the horse packs. The outfitter was going to plant two lakes, but he had a problem with one of his horses on the trail and was unable to get to the second lake.

MOTORCYCLES

Two lakes were planted by using a motorcycle. The cost of stocking was \$4.66 per lake. This appears to be an excellent method for stocking mountain lakes. It should only be used when the trail to the lake is good enough for a trail bike. The person stocking the lake should have experience riding on trails.

HELICOPTER

Twenty-six lakes were stocked from a U.S. Forest Service helicopter in 1986 when some guarantee time was made available to the Department. Although several flights were canceled due to fires, mechanical problems, and medical evacuations, this method seemed well worth the trouble.

Stocking lakes by helicopter combined the advantages of fixed-wing aircraft stocking with those of backpacking. For instance, several lakes can be stocked in one day, and fish can be stocked at a smaller size. Because the drop is usually less than ten feet, fish can usually be planted in the littoral zone of the lake. Also, a more complete lake survey can be attained when stocking from a helicopter. Finally, the involvement of the U.S. Forest Service promoted good interagency relations.

As with fixed-wing aircraft stocking, a major drawback of this method is the lack of an opportunity to temper the fish. Also, if U.S. Forest Service guarantee time is unavailable, flight time can be a major cost, which severely depletes the budget.

SUMMARY

Many alternative methods are available and all should be explored to find the method best suited for stocking each particular mountain lake. Overall, the cost per lake stocked by alternative methods was \$13.50, while the cost per lake stocked by fixed-wing aircraft was \$28.96. The cost per lake stocked by alternative methods, not including those lakes stocked using the U.S. Forest Service helicopter, was \$28.96, the exact cost of stocking by fixed-wing aircraft. In most cases, the costs of stocking lakes will not work out this way, but they will be comparable, and the advantages of alternative methods are overwhelming. The conditions under which the fish are planted are more conducive for better fish survival and the knowledge obtained from a good survey of the lake and the area is invaluable.

Table 1: Cost breakdown for planting mountain lakes aerial stocking versus alternative methods of stocking, by the McCall Hatchery in 1986.

Aerial fish planting	Alternative methods for fish planting
72 Lakes	43 Lakes
5 Flights; By Hatchery Personnel	8 Trips; By Hatchery Personnel
\$27.40/Lake; Flight Cost	
\$ 1.56/Lake; Personnel Cost	\$13.50/Lake; Personnel Cost
\$28.96/Lake; Total Cost	\$13.50/Lake; Total Cost ^a
\$75.00/Lake; Most Expensive Flight	\$79.60/Lake; Most Expensive Trip
\$18.00/Lake; Least Expensive Flight	\$ 3.40/Lake; Least Expensive Trip

^aThe cost per lake planted by alternative methods, not including the use of the U.S. Forest Service helicopter, was \$28.96; the same as the total cost for stocking mountain lakes by fixed-wing aircraft.

Alternative methods for stocking mountain lakes. included backpacking, horse packing, and the use of a motorcycle and a helicopter.

For safety reasons, no solo backpack fish plants were done in 1986, so personnel costs on these plants reflect wages for two or more hatchery personnel.

Table 2: Relationship between size and pounds loaded, time and fish condition while on milk bags before fish planting by the McCall Hatchery in 1986.

Species	Size (F/lb.)	Lbs./ bag	Time in bag (hr.)	Bag temp.	Morts	Fish condition	Lake
GR	6,000	0.500	2.50	12 C	6	Good	Summit
GR	6,000	0.500	4.00	17 C	0	Good	Marge
GR	6,000	0.500	4.5	17 C	6	Good	Malony
C2	818	1.222	1.00	13 C	0	Good	Shaw 12
C2	818	0.611	1.25	11 C	0	Good	Louie
C2	1,400	0.357	3.00	11 C	3	Good	Hidden
C2	1,225	1.224	3.00	-	10	Fair	Cat Cr. 15
C2	1,400	0.714	3.75	12 C	5	Good	Lost
C2	1,268	0.394	7.50	20 C	20	Fair	Buck
C2	1,268	0.394	14.00	21 C	100	Poor	Jungle 11
R4	629	0.799	1.00	13 C	0	Good	Shaw 11
R4	1,050	0.476	2.25	13 C	1	Good	Blue
R4	1,050	0.476	3.50	11 C	0	Good	Shirts
R4	337	0.808	4.00	16 C	1	Good	Hornet ^a
R4	1,050	0.476	4.25	14 C	5	Good	Fawn Cr.
R4	1,050	0.476	4.5	12 C	0	Good	Raft
R4	825	0.606	5.50	17 C	0	Good	Blackwell
R4	1,008	0.500	6.00	23 C	2	Good	Kennally
R4	825	0.606	7.00	19 C	2	Good	Squaw

^aone bag per lake except Hornet Reservoir, which had 11 bags and only one mortality total.